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First Named Inventor	Malone
Art Unit	2875
Examiner Name	Choi, Jacob Y.
Attorney Docket Number	01-1008-A

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PATENT

UNITED STATES PATENT AND TRADEMARK OFFICE
(Case No. 01-1008-A)

In re Application of:	
Malone et al.	**Examiner: Choi, Jacob Y.**
Serial No.: 10/054,173	**Group Art Unit: 2875**
Filed: January 18, 2002	**Confirmation No.: 4542**
For: Method for Vacuum Deposition of Circuitry onto a Thermoplastic Material and a Vehicular Lamp Housing Incorporating the Same	

REPLY BRIEF

Mail Stop Appeal Brief - Patents
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Sir:

This Reply Brief is filed in response to the Examiner's Answer mailed on January 24, 2007.

OK TO ENTER: /JC/ (12/08/2008)

I. INTRODUCTION

The Examiner has not contested any of the basic points that were made in the Applicants' opening brief. This is now the second time that the Applicants have been required to file an appeal, yet once again the Examiner has not demonstrated even a *prima facie* case of unpatentability of the claims in the application.

II. ARGUMENT

First and foremost, the Examiner does not dispute that neither Suzuki nor Elarde teach a conductive layer deposited directly on a substrate that forms part of a lamp housing. Nor has the Examiner cited any other references that teach or suggest such a feature. Each of the cited references in fact teach away from such a directly deposited conductive layer. This substantial distinction renders all of the method claims 1, 8-10, 12-15 and 33-34 ***and*** all of the apparatus claims 16-23, 25, 26, 28-30, patentable.

Moreover, the Examiner has not dispute that neither Suzuki nor Elarde teach a conductive layer of 1 to 4 microns deposited on a substrate of a lamp housing. Once again, each of the references teach away from such a thin layer of conductive material, which would be expected to be particularly problematic in lamp assembly applications. This distinction forms a separate basis for rendering all of the apparatus claims 16-23, 25, 26, 28-30 patentable.

Instead, the Examiner's decision and the Examiner's Answer rest on a series of unsupported and conclusory statements that are contradicted by the references cited by the Examiner, themselves, as addressed below.

The Method Claims (claims 1, 2-5, 8-10, 12-15 and 31-34)

- **Claim 1: "It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a well known method of manufacturing a printed circuit board on a substrate/other suitable high temperature plastics on the lamp housing as taught by Suzuki in order to provide conductive circuits and connection the light source(s) and its power source(s)." (Examiner's Answer, p. 4)**

The Examiner cites no support for this statement, and does not attempt to respond to any of the evidence or arguments cited at pp. 11-12 of Applicants' Opening Brief or in the Nykerk Declaration.

To the contrary, the Examiner acknowledges that none of the references individually teaches the direct deposition of conductive material on a lamp housing. Indeed, none of the references cited teach or suggest direct deposition of conductive material on a housing of any sort. As admitted by the Examiner, "Elarde teaches a method of manufacturing a printed circuit board..." Suzuki, on the other hand, teaches a flat arranging material that contains conductors ("a flexible flat circuit") that is then arranged to accommodate the contours of a lamp housing.

One might ask, as direct metallization to form conductors on printed circuit boards as taught in Elarde was, as the Examiner admits, "a well known method," why Suzuki taught away from that method for lamp housings, and instead taught the comparatively expensive and labor-intensive manufacture and use of a flat arranging material/flexible flat circuit?

Various problems with the complex process disclosed in Suzuki were explicitly discussed in the Nykerk declaration at ¶ 5. Rather than address these issues, however, the Examiner improperly dismissed the Nykerk declaration as "conclusory" and ignored the supporting facts disclosed in that declaration. (Examiner's Answer, pp. 15-16)

As discussed by Mr. Nykerk, Suziki teaches away from any electrical circuits being directly deposited on a lamp housing. *See* Nykerk Decl, ¶ 5. Suzuki explicitly teaches that the reflection surface 30 can be formed by "uniformly applying a coating material to the inner surface [of the substrate]" (Suzuki, col. 4, lines 28-30). When it addresses the circuitry, on the other hand, Suzuki specifically requires that the circuit must be applied in a different

manner, using a "flat arranging material," such as a "flexible flat circuit (Suzuki, col. 4, lines 14-27, 40-41), which contains conductors embedded in a flexible non-conductive material.

Moreover, Suzuki explicitly teaches that the conductors 29 are to oriented away from the lamp substrate (frame 22) and thus separated from the lamp substrate by the non-conductive portion of the flat arranging material 28 (*see* Fig. 3).

The Examiner has not provided any reason that would lead the person of ordinary skill in the art to combine these references. The fact is that such a person of ordinary skill in the art would ***not*** combine a direct metallization reference for the manufacture of printed circuit boards to one that explicitly teaches (a) that a flexible flat circuit should be used and (b) that the conductors are to be isolated from the lamp housing.

Nor does the Examiner address any of design considerations identified in the testimony of Mr. Nykerk. For example, Mr. Nykerk testified that manufacture of a printed circuit board, as taught in Elarde, or a flexible flat circuit, as taught in Suzuki, involved very different considerations than the preparation of a lamp assembly as claimed in the claims under appeal:

> "13. Moreover, a conductive layer that is pre-formed on a circuit board or in a flexible flat circuit involves very different manufacturing considerations and can be made under tighter tolerances than a conductive layer deposited directly on a lamp assembly substrate. Lamp assembly substrates require larger components, often contoured, which make position and even distribution of conductive material more difficult ..." (Nykerk Declaration)

As such, these references simply cannot be combined to yield direct metallization of a lamp substrate as suggested by the Examiner. The Examiner's failure to address these considerations highlights the failure to establish even a *prima facie* case of obviousness.

- **Claim 1: "Elarde teaches ... direct metallization to form a layer of conductive material on a contoured/generally non-planar surface of a substrate that forms part of the " (Examiner's Answer, p. 4)**

Elarde itself does not teach or suggest the invention alone or in combination with Suzuki as it does not teach forming a layer on a "generally non-planar surface of a substrate ... in order to form part of one or more electrical spray circuits." To the contrary, the portion of the substrate that is directly metallized "to form part of one or more electrical spray circuits" is ***defined*** in Elarde to be generally planar. Fig. 15 of Elarde, which was not reproduced in Examiner's Answer at p. 4 shows this explicitly:

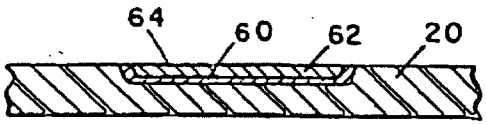

Fig. 15

In Elarde, as shown above, the deposited metal particles 60 and 62 that form part of one or more electrical spray circuits are indeed deposited on a planar surface as shown at reference number 60. Elarde specifically states that the channels formed in the surface of "generally planar substrate 20" (col. 3, lines 7-9) have a depth "that is generally uniform throughout the entire surface of the substrate." (Col. 4, lines 7-11). To the extent that there is overspray on any other surface, Elarde teaches that it must be ground away, and does not form part of one or more electrical spray circuits.[1] The abrading steps taught in Elarde would be inconsistent with and impossible to apply to form circuits in any "generally non-planar" surface.

In short, Elarde does not supply the teaching missing from Suzuki, in order to render claim 1 (or any claims that depend from this claim) obvious.

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[1] "The final step is to sand, grind, machine or otherwise abrade away the metal layer 28 down to the level of the non-channel portion of the surface 26. This will leave an electrically conductive patter on the upper side of the board with consists of a plurality of metal-filled channels 38." (Col. 6, lines 11-16.)

- **Claim 8: "In addition, Elarde discloses a step of forming distinct electrical pathways in the layer of conductive material during deposition" (Examiner's Answer, p. 5)**

The Examiner fails to provide any citation within Elarde for this conclusory statement. Furthermore, Elarde does not specify whether any pathways formed are distinct or interconnected.

- **Claim 9: "In addition, Elarde disclosed the distinct electrical pathways are formed ... by masking the lamp housing prior to deposition of the layer of conductive material on the lamp housing." (Examiner's Answer, p. 5)**

The Examiner fails to provide any citation within Elarde for this conclusory statement. Moreover, Elarde does not disclose a lamp housing, much less masking of a lamp housing.

- **Claim 12: "In addition, Elarde discloses a step og applying a protective coating to the conductive material (e.g., "*additional layer*"; Figures 14, 15, 18, 19, 21 and 22) (Examiner's Answer, p. 5)**

The Apparatus Claims (Claims 16-30)

As with the method claims, the Examiner's argument rests on unsupported and conclusory statements that do not establish a *prima facie* case of obviousness:

- **Claim 16: "Suzuki et al. clearly discloses a conductive layer (e.g., Figure 4) for one or more electrical circuits deposited directly (e.g, Figure 3) on the substrate." (Examiner's Answer, p. 6)**

Contrary to the statement by the Examiner, Suzuki explicitly teaches that the conductors 29 are to "exposed," *i.e.*, oriented ***away*** from the lamp housing substrate (frame 22) when the flat arranging material is installed. Thus, Suzuki teaches that the electrical circuits are to be separated from the lamp housing substrate by the non-conductive portion of the flat arranging material 28 (*see* Fig. 3 and description at Col. 4, lines 14-17). In no way does Suzuki teach or suggest that a conductive layer of an electrical circuit can be deposited directly on the substrate.

Elarde also does not supply this missing teaching. As such, the Examiner's argument that this feature is shown by the prior art is clearly in error.

- **Claim 16: "Elarde teaches the depth of the conductive layer is approximately 0.003-0.010. It would have been obvious to one having ordinary skill in the art a the time the invention was made to specify a workable range of the conductive layer on the substrate ..." (Examiner's Answer, p. 6)**

This conclusory statement is unsupported by any prior art references. The Examiner notably omits the unit of measurement, which is in inches. As discussed in the Applicants' opening brief, the claimed thickness of 1-4 microns is nearly 20 times thinner than the minimum thickness taught in Elarde. This difference is significant, in terms of both cost and weight savings. Given the rigors under which lamp housings are used, the claimed thickness would not be expected to be adequate, much less an optimum or workable range. The Examiner has given no evidence that would support even a *prima facie* case of obviousness in this regard.

Moreover, the reliance on *In re Aller*, 105 USPQ 233 is improper. This is not a situation where the general conditions were disclosed in the prior art. Nor is it a situation where the prior art taught values that were only a few degrees or a few percentage points outside of the claimed range. To the contrary, as shown above, none of the references teach the metal deposition of a circuit on a lamp housing (or any housing for that matter) of any thickness. Moreover, *Aller* does not address the significance of the claimed range here which is nearly 20 times smaller than Elarde taught was necessary (for a printed circuit board!).

Indeed, the Examiner's statement that "Elarde suggest the desirability of fabricating through processes involving a minimum number of steps and a minimum amount of materials (e.g., column 1, lines 55-61)" (Examiner's Answer, pp. 11-12, emphasis in original) highlights the problems with the Examiner's position. If Elarde recognized that a minimum amount of materials was desirable, why would the person of ordinary skill in the art be expected to disregard its teaching that the minimum thickness of the conductive layer should be 0.001 inches? And as Elarde teaches that such a minimum thickness is necessary for a printed circuit board, which is generally protected inside a casing of some sort, why would a person of ordinary skill in the art be expected to consider that conductive layers nearly 20 times thinner would be "optimum" when directly applied to a lamp housing?

The Examiner has not established that it would have been *prima facie* obvious or involved merely routine skill to determine that a circuit could be applied directly to a lamp housing sub-

strate, and function with a thickness substantially below what was taught in Elarde for a printed circuit board.[2]

Once again, the Examiner's Answer makes no attempt to address the testimony by Mr. Nykerk set forth in his declaration. Mr. Nykerk describes the particular problems faced with lamp housings, including the rigorous handling and operating conditions, the difficulty of positioning and applying an even distribution of conductive material over such an assembly, and how a conductive layer of 1 to 4 microns would not be considered "optimum" in light of these conditions. Nykerk Decl., ¶¶ 12-14, 23.

In short, the Examiner's conclusory statement that this is a mere optimal range does not establish even a *prima facie* case of obviousness. To the contrary, the evidence before this Board, including the references themselves and the Nykerk declaration, confirm that Applicants' invention would not have been obvious to a person of ordinary skill in the art. As such, claim 16 and each of the claims that depend from it should be deemed patentable.

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[2] The Examiner states that "the recitation 'a lamp housing etc.' has not been given patentable weight because the recitation occurs in the preamble." (Examiner's Answer, p. 13). This is the first time during the entire course of prosecution – including a prior appeal – that the Examiner has stated this argument or taken this position. Applicants object to the late submission of this new – and clearly incorrect – ground for rejection. This is not a situation where a preamble merely cites a property of the claimed structure, but instead defines a part of the structure. The term "substrate" has no meaning divorced of the preamble, which defines it as part of the lamp housing. In this regard, the *Kropa* case cited by the Examiner found, on substantially the same facts, that the phrase "An abrasive article" in a preamble was indeed a limitation to be given patentable weight in the claims. *Kropa v. Robie and Mahlman*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

III. CONCLUSION

Thus, for the reasons stated above, the method claims 1-6, 8-10, 12-15 and 31-34 and the apparatus claims 16-23, 25, 26 and 28-30 pending in this application should be allowed to issue.

Respectfully submitted,

Date: March 26, 2007

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